Space Weather Forecast

Issued on Tuesday, 14 November 2023 at 01:16 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate-class flares, risk declining through the period. Slight Chance of a G1/Minor Geomagnetic Storm on Day 2 (15 Nov).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours with only Common-class flares observed. There are currently five sunspot regions on the visible disc, all of which lie in the west. The eastern disc has several areas of plage, although no sunspots are currently evident. The largest region is in the northwest of the disc, perhaps with some minor magnetic complexity, however this is getting more difficult to assess as it nears the western limb. A new region appeared in the southwest through 13 Nov and is now currently one of the more unstable regions with regards to flare probabilities. The other regions have all shown some signs of growth, have increased in magnetic complexity or both.

No Earth-directed Coronal Mass Ejections (CMEs) have been observed in the past 24 hours.

Solar Wind / Geomagnetic Activity: Solar winds have predominantly remained at slightly elevated levels between 400-450 km/s having initially been on a slightly declining trend. The total magnetic field strength (Bt) has been largely moderate but fell weak for a time between 13/0730-1500 UTC. The important north-south component (Bz) was weakly negative (southward) until 13/0200 and has since been mainly weak and positive (northward). From around 13/1500 UTC Bz has become more moderate. Geomagnetic activity has been Quiet to Unsettled (Kp 0-3), but with a G1/Minor Geomagnetic Storm (Kp 5) interval at 13/0000-0300 UTC.

Energetic Particles / Solar Radiation: Solar radiation levels remained at background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to remain at Low levels, with a chance of Moderate class flares, mainly Days 1-2 (14-15 Nov). The probability of M-flares declines by Day 3 (16 Nov) as sunspot regions rotate off of the disc. No significant new or returning regions are expected to rotate onto the visible disc during the next four days.

Solar Wind / Geomagnetic Activity: A faint and slow Coronal Mass Ejection (CME) was observed leaving the Sun late on 10 Nov. There is a chance that this may give Earth a glancing blow on Day 2 (15 Nov) but with very limited impacts expected. Solar winds are expected to decline to slow-ambient levels through Day 1 (14 Nov), but may see some enhancements Days 2-3 (15-16 Nov) due to a combination of weak effects from coronal hole fast winds and the possible CME arrival.

Overall, Quiet to Unsettled (Kp 0-3) geomagnetic activity is expected. Chance of Active (Kp 4) intervals and a slight chance of an isolated G1/Minor Geomagnetic Storm (Kp 5) on Day 2 (15 Nov) due to the potential combination of weak enhancements from coronal hole fast winds and the possible CME arrival.

Energetic Particles / Solar Radiation: There is a slight chance of S1/Minor Radiation Storm

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conditions during the period should any sunspot regions produce significant flares. Probabilities begin to wane later in the period as these regions rotate well beyond the western limb.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	5	10	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	15	5
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	2	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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